# TESTING THE PECKING ORDER THEORY OF CAPITAL STRUCTURE: KAZAKHSTAN EXPERIENCE

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# Contents

# Abstract

The aim of this work is to test whether publicly available companies from Kazakhstan follow the pecking order theory of capital structure in their financial decisions. We defined the importance of the financial leverage ratio as a key coefficient demonstrating financial stability of the company. The financial reports of the biggest companies were used to identify the independent variables which become the determinants of capital structure choice. Results of econometric analysis partially confirmed the predicted hypotheses of the relationship between leverage ratio and determinants. Overall, the outcomes of this work assist financial managers in terms of financial risk management and strategical decision making in defining the capital structure of the firm.


# 1 Introduction

In the modern economies many projects are financed by external sources when companies are taking loans to finance their current expenses. The value of liabilities affects company in terms of risk management, strategic planning, expected revenue and seniority of the capital structure in case of bankruptcy.

Studies of companies operating in developing capital markets have only just begun to appear and have not yet led to any lasting results either in terms of the determinants of the capital structure or in terms of the motives determining the management's hierarchy of the source of funding. The choice of Kazakhstan as a subject of research gives us an excellent example of middle-income economy.

In this research we want to answer the following question: do the companies from Kazakhstan follow the pecking order theory in their financial decisions? Our main goal is to check if our results are in line with various researchers who tested pecking order hypotheses on different data sets from different countries. We adopted the methodology of testing pecking order theory on unique data set, moreover I have not found any similar published works on the example of Kazakhstan.

This study is important because it may help managers of the tested companies to maximize their values by following the main findings of pecking order theory.

# 2 Theory and Literature Review

Considering the importance of the choice of capital structure in financial stability of the company, the big amount of both theoretical and empirical researches had been done. The theoretical basis of capital structure and the pecking order theory is described in this part while empirical findings are presented in the section concerning the determinants. The formation of the capital structure is a primary focus of researchers in the field of financial economics. The capital structure is the aggregate of the company's financial resources from various sources of financing. There are internal and external sources of financing the operational and capital expenditures for the company. Retained earnings, net profit, current assets (cash), fixed assets (account receivable or equipment which can be easily converted to cash) and owners' investments are the examples of internal financing. Bank loans, bonds and shares issued, venture capital and state aid are the major sources of external financing.

The early Modigliani-Miller (1958) theory claims that both internal and external sources of financing projects cost the same amount in a model with perfect competition and without differences in taxation and transaction costs. But, the proposition of irrelevance of capital structure does not work due to the existence of the costs of financing. The presence of corporate taxes, information asymmetry and bankruptcy costs are the main examples of costs. The same Modigliani-Miller (1963) published the second work in which the tax on corporations was introduced into the original model. Considering the existence of taxation, it was shown that higher proportion of borrowed capital will cause higher share price. However, from a certain point, the value of the firm begins to decline because a riskier debt compensates the saving on corporate tax payments. Myers and Majluf (1984) have found that the information asymmetry problem is appearing when the corporation

managers can accurately know the true values of the company's current financial position while investors not owning data on the internal state of the company can only assume possible values of the company's revenues. Companies would prefer to issue debt rather than to issue securities when external financing is necessary. This happens because the information costs associated with debt issuance are lower than the costs associated with the issue of shares. Finally, all these conclude about the prevalence of internal over external sources of funding that in general can be explained by the higher cost of external financing. And this prevalence tells us about the existence of hierarchy of sources of financing.

Myers and Majluf (1984) demonstrated that due to the existence of such costs companies prefer internal financing rather that outside investments. **The pecking order theory** of capital structure is one of the most influential theories that explain the existence of this hierarchy. If the company has received a net profit this year management will send it to pay off the existing debt load, then to cover operational costs or invest in new profitable projects and finally will pay dividend payments in the last order. The hierarchy of financing assumes that managers use to take loans or issue bonds only when they spend all internal sources of funding. If domestic sources are not enough management implements the liquid securities available to the company in the first order. In case of shortage of funds, the company will resort to external sources by the following order: first, by taking bank loans; second, by issuing hybrid financial instruments (preferred shares, convertible bonds, etc.), and only as a last resort to issue ordinary shares. It turns out that the company adheres to a certain order of financing that is the basis of the pecking order theory.

We can use the conclusions of the model of Shiam-Sander and Myers (1999), which shows how companies select funding sources in the event of a shortage of resources. If the company has enough equity, then there is no shortage of sources of financing. Company follow the pecking order theory if it does not have its own sources and there is a deficit which forces the managers to borrow money and only in extreme cases to the issue the shares. Shiam-Sander and Myers have found strong support of this theory based on sampling of 157 American companies

whose shares were analyzed during the period of 17 years. Pecking order theory is proposed as an empirical a model of corporate leverage. Thus, there is no optimal structure of capital and an accurately defined ratio of debt and equity. The formation of the capital structure depends on the company's preferences regarding the choice of one or another source and the funding hierarchy is associated with the asymmetry of information.

Frank and Goyal (2002) suggested to use regression of leverage and used the obtained results information about companies in describing the financing gap of the pecking order theory. The empirical analysis is based on the leverage regression which was based on four independent factors: the tangibility of assets, value of assets to book value, the log of sales and profitability.

# 3 Determinants

After considering the key postulates of pecking order theory we will define the determinants that explain the capital structure decisions. The description, formula, relationship with the dependent variable as well as the confirmative empirical work are provided of each determinant. Finally, we will set a hypothesis regarding each determinant's relationship with the dependent variable.

## 3.1 Leverage

The coefficient of financial leverage is the ratio of debt to total liabilities chosen by the company to solve long-term problems from its strategy. Generally, enterprises form a financial leverage to increase the return on their funds invested in the business. The equal ratio of debt to total liabilities is considered optimal which means the coefficient of financial leverage is 0.5. While in large public companies this ratio can be close to 1. But, company may lose its financial independence and its financial position becomes extremely unstable in case of large values of the leverage coefficient. It is become more difficult for such organizations to get additional

loans. Practice has demonstrated that the most common value of the coefficient is 0.6 or 60% of borrowed capital and 40% of own capital. Meanwhile, using borrowed capital company can simultaneously increase or decrease the return of own capital. The increase or decrease of return on equity depends on average cost of borrowed capital (average percent rate) and allows to measure the effectiveness of the company in choice of sources of financing. So, we see that debt is dynamic component. We use the financial leverage as a dependent variable because we associate the change of dept-to-equity ratio with the determinants described above and these relationships will be analyzed in each determinants' description.

Frank and Goyal (2002) suggested to use regression of leverage and used the obtained results information about companies in describing the financing gap of the pecking order theory. There is no single formula to calculate the financial leverage ratio, so we need to analyze several approaches by various authors. The most common type of leverage was proposed by de Jong (2010) as total debt to total liabilities ratio. Titman and Wessels (1988) used six interpretations in their empirical analysis, but we will count leverage as a long-term debt divided by book value of liabilities.

## 3.2 Tangibility

Tangibility - the structure of the assets, expressed in fixed assets divided by total assets.

The structure of the assets can influence the choice of capital structure. Fixed assets cannot be fast convertible into liquid assets which can be used as a source of financing. The prevalence of fixed assets does not allow companies to rely on internal financing. So, companies need to take external loans and increase the leverage ratio. The pecking order hypothesis regarding the negative influence of tangibility was demonstrated by Mazur (2007) on the example of Polish companies.

Hypothesis 1: tangibility will have negative relationship to the leverage ratio.

## 3.3 Profitability

We calculate profitability of the company as a value of earnings before interest, taxes, depreciation and amortization (EBITDA) to the percentage of total assets.

The indicator is useful in comparing companies of one industry but differing in capital structure. At the same time, investment size, debt level or the tax regime are not important - only the type of activity and operational results matter. Thus, this coefficient allows to analyze firms with various accounting policies (for example, in terms of accounting for depreciation or revaluation of assets), various taxation conditions or the level of debt level. A more profitable company has more opportunities to enter the financial markets. At the same time, after taking off the depreciation value we are not clear about the company's real need for investment. Companies with high amortization value such as oil and gas or mining companies which consist most of the economy of Kazakhstan are interested in actively using this indicator. These companies can overestimate their results since the adjustment to depreciation significantly improves their profit.

More profitable companies have higher earnings which they can use to finance their future operational and capital costs. It will lead that company will have lower possibility to take additional risk by relying on loans or issuing shares according to pecking order theory. The empirical finding of such relationship was found by Kaur and Rao (2009) on the example of Indian companies.

Hypothesis 2: profitability will have a negative relationship to leverage raito.

## 3.4 EBITDA margin

This ratio is calculated as EBITDA (Earnings before interest, taxes, depreciation and amortization) divided by total revenue.

The purpose of this indicator is to determine the percentage of profit from the turnover of the company for a certain period not including in the calculation of expenses for taxes and credit interest. EBITDA shows the company's profit before various payments. These payments are either delayed for some time and this

money can be repeatedly used by the company. Companies do not have to pay interest for these payments or in the case of depreciation money does not leave the company at all which allows them to be used in the future.

Mazur (2007) has found a positive relationship between leverage and EBITDA margin. We also expect positive influence of the EBITDA margin to the leverage ratio. Higher value of this indicator means that companies will prefer internal financing, and this assumption follows the pecking order theory.

Hypothesis 3: EBITDA margin has positive influence of to the leverage ratio.

## 3.5 Asset utilization

Asset utilization is measured as the revenue divided by total assets.

Asset utilization or turnover is a financial indicator of the intensity of the organization's use of the entire set of available assets. As assets equals liabilities in the balance sheet, we can call this coefficient a liability turnover as well. The ability of a company to quickly repay its debts is a factor demonstrating the financial stability of this firm. Generally, the companies with a higher revenue to assets ratio can easier meet its debt payments. On the other hand, low level of turnover will increase the possibility of bankruptcy. Firms in this case will take more debt to avoid financial difficulties and this will increase the leverage ratio. Also, higher revenues mean higher undistributed earnings in total which will lead the company to rely on internal sources. All these factors tell us about the negative relationship between asset utilization coefficient and the financial leverage ratio.

In the work of Kaur and Rao (2009) we have found that firm will follow the pecking order theory if it has an appropriate ratio of net earnings which can be used to finance future projects and the management is not willing to pay dividends in the current period. The findings of Kaur and Rao (2009) have direct confirm of the negative relationship between asset utilization and leverage in their empirical study.

Hypothesis 4: asset utilization has negative influence on the leverage ratio.

## 3.6 Dividend policy

This coefficient is found as ratio of dividends paid by the total equity value.

The higher coefficient of dividends paid means that companies have less opportunities to finance their projects using own resources. This will increase the dependence from external financing. Authors as Al-Najjar (2011) have found that dividends play an unimportant role in capital structure while the correlation between leverage and dividends was significant. But, when Mazur (2007) divided companies which pay dividends, and which doesn't he has found that companies which regularly pay dividends fully support hierarchy in capital structure.

We need to consider that many of tested companies in Kazakhstan are owned by the national fund "Samruk Kazyna" which is controlled by the government. This means that they will follow the dividend policy of the national fund and in majority of cases the number of dividends will be equal the amount of net profit.

Hypothesis 5: dividend policy will have positive relationship with the leverage ratio.

## 3.7 Free cash flow

Free cash flow (FCF) ratio is equal to ne t changes in cash flow from all three financial activities (operational, investing and financial) in cash flow statement to the total assets in balance sheet.

This net cash can be used to finance new projects or to increase the value of the company by increasing own capital. FCF is the first available source of external financing and the higher value of FCF the lower leverage ratio will be. Lopez-Garcia and Sogorb-Mira (2008) used net operational cash flow to total assets ratio to check the pecking order hypothesis on the example of Spanish companies. These authors in their study defined negative influence of FCF and proved that Spanish firms prefer to finance their projects using internal sources rather that external.

Hypothesis 6: FCF will have negative relationship with the leverage ratio.

## 3.8 Liquidity

Liquidity is measured as the coefficient of current assets to the current liabilities in balance sheet.

Liquidity is the ability of a company to pay its short-term obligations by realizing its current assets. The task of analyzing the liquidity of the balance sheet is necessary for understanding the creditworthiness of the firm or its ability to fully settle for all its liabilities. The analysis of the liquidity consists in comparing the assets grouped according to the degree of their ability to be sold with liabilities grouped by the terms of their redemption and distributed by their increasing maturity.

Myers and Rajan (1998) considering the principles of pecking order theory concluded that firms with higher amount of liquid assets can use these resources to finance their projects and not take costly external obligations. The rise of liquidity will lower the leverage ratio, so this result show that liquidity had negative relationship with leverage ratio. We set a hypothesis of a negative relationship between liquidity and leverage ratio.

Hypothesis 7: negative relationship between liquidity and leverage ratio.

## 3.9 Size

We will estimate the book value of the company's size by taking natural logarithm of the total assets in balance sheet.

The pecking order theory states that bigger firms will tend to have higher leverage ratio rather that small companies. Usually big companies are more diversified and have higher rates of borrowed capital because they are not allowed to finance all projects only with external sources due to lack of it. In contrast, small companies have higher profits ratio and prefer to rely on own resources according to Myers and Majluf (1984). Hypothesis 8: size has negative influence on the leverage ratio.

### 3.10 Ownership

This dummy variable is equal to 1 if the company is state owned and zero if it is private.

The most of big companies in Kazakhstan are state owned (national) especially in such industries as oil and gas, mining or railways. Being state company means that company may hope for external financing rather than relying only on its own. The board of state-owned companies in case of financial difficulties may count on government support. External financing becomes much easier if company is supported by the government. In contrast, private companies cannot rely on cheap external financing and they prefer to use internal resources. This is example of the reverse of pecking order theory.

Hypothesis 9: state ownership has negative influence on the leverage ratio.

## 4 Data

The main source of data in implementing my research is the financial statements of publicly traded companies. Companies are obliged to publish financial statements every quarter and the final report at the end of a year. Generally, financial data is audited, and it is a reason why we can trust this data. There are 4 basic financial statement: balance sheet, income statement, statement of cash flows and statement of retained earnings. All determinants can be calculated using only the information of financial statements.

I have used four sources of information to collect financial statements. First is the website of Kazakhstan's Stock Exchange kase.kz which is considered reliable because it collects only audited financial reports from local public companies. Second, I looked for the financial information from official websites of the companies where they publish all commercial data. The third is Bloomberg where I have found the financial information of the biggest companies. And finally, the forth source of financial information is the London Stock Exchange (LSE), where

I collected the financial statements of Kazakhstani companies. There are only 5 publicly traded companies in LSE originally from Kazakhstan.

Kazakhstan Stock Exchange (KASE) was founded in 1993 and is the main capital market for companies from Kazakhstan. The capitalization of companies represented in KASE grew constantly and in 10-year period of survey increased by 64%. In 2007 the capitalization of share market reached 7 569 billion KZT and by 2016 it rose till 12 401 billion KZT. In total, there are 130 companies listed in KASE in 2016.

Considering the specific formation of the capital structure by financial sector companies and the real estate industry the companies representing these industries were not included. For example, the capital structure of banking companies is regulated by Basel agreements and in general the level of debt is several times higher than in companies in other spheres. Out of total 130 companies listed in KASE 30 are banks and 17 are financial organizations which cannot be counted in my research. The market capitalization of banks and other financial companies in KASE is about 4 700 billion KZT or 38% of all KASE capitalization.

I formed a sample of the 46 largest companies from different spheres in Kazakhstan. These companies represent about 90% of capitalization of non-financial market of KASE while the market cost of these companies equal 7 trillion KZT. All companies have a long-term credit rating below BBB+ according to Standard and Poor's credit rating scale and consider as speculative level companies. This rating tells investors that company is solvent but unfavorable economic conditions may adversely affect the possibility of payments.

Moreover, there are several companies that have business and main assets in Kazakhstan but listed in foreign stock exchanges. Many of these companies are listing debt securities, but there are some which could make IPO and trade their shares in LSE. IPO in LSE allows companies to attract large amounts of money than in KASE. Business valuation in the case of a freely traded company is usually higher as well as publicly traded shares are more liquid. In addition, the listing of the world's largest exchanges like LSE is very prestigious. The market capitalization of 5 companies that are listed in LSE from Kazakhstan origin is equal

approximately to 8 billion pounds.

The selected data is taken in the period from 2007 till 2016. This ten-year period covers the most interesting part of Kazakhstan's economic history when the economy was booming, and we can estimate the effect of financial crisis (2008-2009) and economic crisis (2014-2016).

The represented data is not balanced panel of firms across years. There are several companies which data are not presented on 10-year period. There are two reasons of that: one part of companies was established after the beginning of my survey and there are companies that did not presented financial reports during some years. Generally, these companies are relatively small and works in the industries that become popular in Kazakhstan in several years such as telecommunications or retail. In total I have collected financial data from 46 companies, but I have only 451 observations. The unbalanced panel has no serious biases, for example I can generalize the results by years and missed data in some years will not create troubles from econometrical side.

# 5 Methodology

To test pecking order theory, we will follow the empirical model developed by Shyam-Sunder and Myers (1999). Their model is based on the leverage level and the set of determinants that were used to analyze the debt-ratio relationships. We also will use the regression of leverage but in our case, we will use more independent variables described in determinants part. Our regressions are based on panel data which means that the data applies for big variety of firms and belongs to different time periods.

The set of independent variables in the regression are represented by the following equation:

$$x_{it}\beta = \beta_1 \cdot tangibility_{it} + \beta_2 \cdot profitability_{it} + \beta_3 \cdot EBITDA\_margin_{it} + \\ + \beta_4 \cdot asset\_utilization_{it} + \beta_5 \cdot dividend_{it} + \beta_6 \cdot FCF_{it} + \beta_7 \cdot liquidity_{it} + \\ \beta_8 \cdot size_{it} + \beta_9 \cdot state_{it}$$

Regression $lev_{it}$ with dependent variable and independent variables that both include observed variables $\beta x_{it}$ that changes across time $t$ and $i$ which indicates individual firms as well as unobserved component (unobserved heterogeneity) $c_i$ and $u_{it}$ the idiosyncratic errors because these also changes across $t$ and $i$.

$$lev_{it} = x_{it}\beta + c_i + u_{it}$$

Using a model with the data only from one source which in our case is a financial report could lead to possible endogeneity problem. In fact, the variables like profitability may impact leverage as well as leverage may form profitability. After the analysis of determinants, we also defined that variables such as free cash flow, size and asset utilization are also shape leverage and leverage impact them. Also, we have defined that our unobserved component $c_i$ is correlated with $x_{it}$ or $Cov(x_{it}, c_i) \neq 0$ which may cause serious problems. But, knowing that we have panel data and can observe $y_t$ and $x_t$ at different time periods, and considering $c$ is time constant, we can solve this problem using sequential moment restrictions.

$$lev_{it} = x_{it}\beta + c_i + u_{it}$$
$$lev_{i,t-1} = x_{i,t-1}\beta + c_i + u_{i,t-1}$$

Then, we interpret the population regression function by:

$$E(u_{it}|x_{it}, x_{i,t-1}, \ldots, x_{i1}, c_i) = 0, t = 1, \ldots, T$$

Which is equivalent to:

$$E(lev_{it}|x_{it}, x_{i,t-1}, \ldots, x_{i1}, c_i) = \beta x_{it} + c_i$$

Considering this we see that after controlling $x_{it}$ and $c_i$ no past values of $x_{it}$ affect the expected value of $y_{it}$. We need to transform the initial regression to remove $c_i$ and then find instrumental variables. Use the first difference method:

$$\Delta lev_{it} = \Delta x_{it}\beta + \Delta u_{it}, t = 2, \ldots, T$$

Where $\Delta x_{it} = x_{it} - x_{i,t-1}$, $\Delta u_{it} = u_{it} - u_{i,t-1}$ and $\Delta lev_{it} = lev_{it} - lev_{i,t-1}$

Now we get the following assumptions:

$$E(x\prime_{is}u_{it}) = 0, s = 1, \ldots, t$$
$$E(x\prime_{is}\Delta u_{it}) = 0, s = 1, \ldots, t-1$$

So, we can use the matrix $z_{it}$ as an instrumental for $\Delta x_{it}$, when $z_{it} = (x_{i1}, ..., x_{i,t-1})$

Considering that $z_{it}$ is not correlated with $\Delta u_{it}$ we know that

$$E(Z\prime_i \Delta u_i) = 0$$

Where $Z_i$ is a matrix:

$$\begin{bmatrix} \Delta x_{i2} & 0 & 0 & \ldots & 0 \\ 0 & \Delta x_{i3} & 0 & \ldots & 0 \\ \ldots & \ldots & \ldots & \ldots & \ldots \\ 0 & 0 & 0 & \ldots & \Delta x_{i,T-1} \end{bmatrix} = \begin{bmatrix} z_{i2} & 0 & 0 & \ldots & 0 \\ 0 & z_{i3} & 0 & \ldots & 0 \\ \ldots & \ldots & \ldots & \ldots & \ldots \\ 0 & 0 & 0 & \ldots & z_{iT} \end{bmatrix}$$

Where we can use all values from $\Delta x_{i3}$ to $\Delta x_{i,T-1}$ as the instrumental variables.

Then, this equation can be measured by pooled two stage least squares (2SLS) method using the instruments above to solve the endogeneity problem.

Our variables are modeled as dependent on its own lag values, so the natural extension to the autoregressive model is the vector autoregression. The results of lag-order selection statistics for series of vector autoregressions are in Appendix 4.

We want to define separate regressions for governmental, non-governmental companies as well as for companies from LSE. Then, we set separate regressions as leverage of governmental companies - *lev_gov*, leverage of non-governmental companies - *lev_nongov*, and finally *lev_lse* is for leverage of LSE companies.

$$lev_i = x_i\beta + u_i$$
$$lev\_gov_i = x_i\beta + u_i$$
$$lev\_nongov_i = x_i\beta + u_i$$
$$lev\_lse_i = x_i\beta + u_i$$

We check the results of the regression by computing the Huber-White standard errors to make sure that estimated standard errors are more robust.

# 6 Results

In this part we interpret the main findings of the analysis of our data. The analysis consists of 2 main parts. First part includes descriptive statistics of determinants, the analysis of industries and description of main financial data of "Samruk-Kazyna". And the second part includes the interpretation of OLS results where we describe the results of each independent variable and its deviation from the predicted value. This comparison will show us the correctness of our hypotheses.

## 6.1 Descriptive statistics

Table 1 demonstrates the distribution of selected sample of companies into different industries of economics. There are 12 industries in total with the highest number of represented companies were in metal processing industry (22%), oil and gas sector (17%) and transport companies (11%). The attained result is not surprising because economy of Kazakhstan is resource oriented when the most of big companies are working in mining of resources. Also, a big branch of companies is from food producing sector. Finally, these are several companies from industries representing electro-engineering (4%) or chemical (2%) companies.

The summary of descriptive statistics is presented in Table 5. We have divided this table into two parts: the description of dependent variables or different types of leverage and the description of all independent variables.

The median values of almost all types of leverage are centered in 0.5 which means that half of the companies have more liabilities in balance sheet while another half prefer more equity. The received results are similar that was demonstrated by Mazur (2007) where the author indicated that the mean value of leverage is around 52%. Moreover, it was interesting to measure that balance sheet of several companies are totally consist of liabilities which means that their leverage ration is up to 0.99. A good example of such a company is "Atameken Agro" where it has only 1% authorized capital as an equity and the rest 99% of balance consist of debt. The situation is similar in other agricultural companies where the

Table 1: Industry distribution

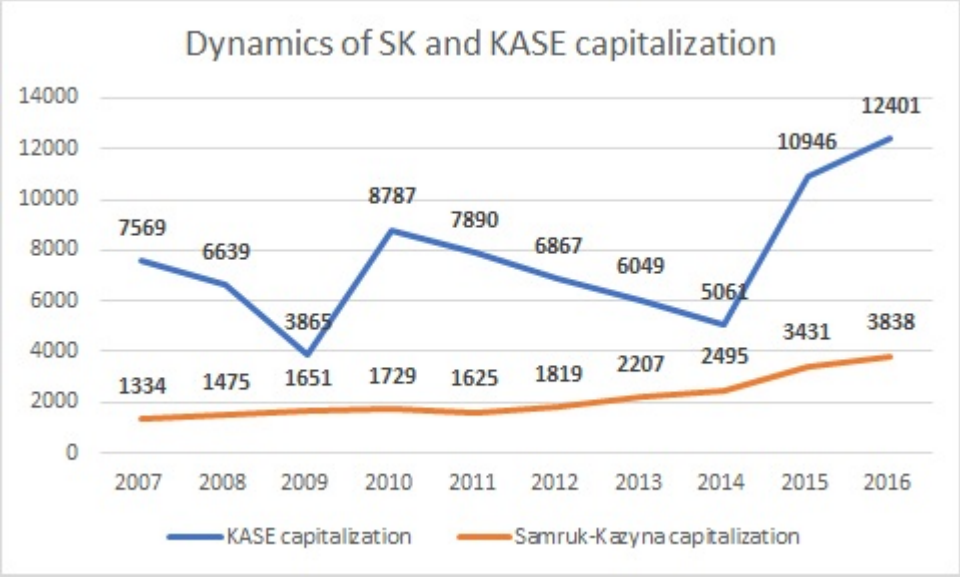
| Industry | Number of companies | Fraction (%) |
|---|---|---|
| Metal | 10 | 22% |
| Oil&Gas | 8 | 17% |
| Transport | 5 | 11% |
| Agriculture | 4 | 9% |
| Energy | 4 | 9% |
| Food | 4 | 9% |
| Telecommunication | 4 | 9% |
| Construction | 3 | 7% |
| Electroengineering | 2 | 4% |
| Chemicals | 1 | 2% |
| Retail | 1 | 2% |
| Total | 46 | 100% |

average leverage ratio is 86%. Such a dramatic situation happens because most of agricultural companies are relying on subsidies from the state or banking loans to cover past debts. At the same time companies in oil and gas or metal sectors are having the lowest leverage ratios. The reason of that is the high profitability of such sectors when these companies could finance their capital and operational expenses using retained earnings.

The mean values of profitability, tangibility and EBITDA margin vary from 49 to 61% and tell about high profitability indicators of companies from Kazakhstan. This situation is typical for fast developing economies when Kazakhstan has demonstrated 6-8% annual grows in 2000-2008 and 4-5% growth in 2010-2014. A small number of companies had a negative net profits and only 14% of observations have negative value of profitability. Most of such companies are from agriculture sphere.

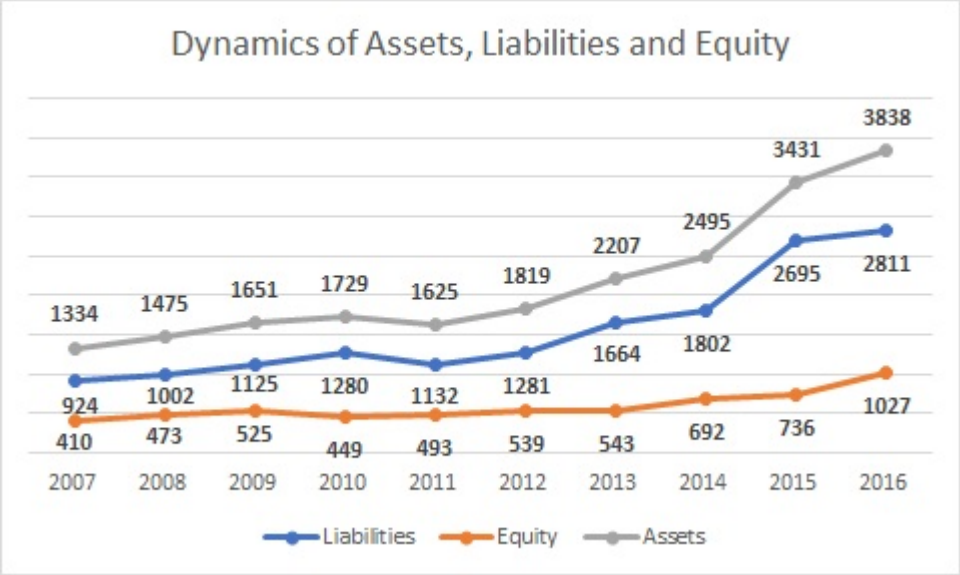
To understand the real financial situation in companies from real sector of economics we will present the enlarged financial data of “Samruk-Kazyna” (SK) - the

leading company in Kazakhstan which represent almost all governmental sector and has a big share in the whole economy of Kazakhstan. Table 6 demonstrates the financial reports of SK company as well as the total capitalization of KASE.




Public governmental companies which are listed in KASE are mainly but not all represented by SK. The share of SK in total capitalization of KASE is large. It varies from 18% till almost half of all KASE. It is interesting finding that the share of SK rises in crisis years, for example in 2009 SK represented 43% and in 2014 49% of total KASE capitalization. But when Kazakhstan's economy starts growing again the share of SK falls. The main reason of the rise of the SK share is instability of other companies while SK grew linearly. These can be explained by various factors, for example by industry problems, more professional management of SK, financial management, appearance of new companies in KASE after the crisis and ctr., but generally these reasons depend from company to company. In addition, in 2009 and 2015 KASE started the program of massive IPO when several big companies started trading in KASE. This lead to fall the rate of SK.

The total balance sheet of SK is growing steadily. In 10 years of research total assets grew in almost 3 times (288%) from 1 334 billion KZT till 3 838 billion KZT. But this growth mainly happened due to the growth of liabilities especially in 2014-2015 when SK decided to take additional loans to cover financial difficulties. The value of equity also grew by 251% but liabilities grew more to 304%.




Considering the income statement, the values of revenue demonstrated the constant growth with some deceleration in 2009 and in 2013. But, overall, the revenue grew by 317% in 10-year period which can be classified as an excellent result even for developing economics. At the same time, the dynamics of net income had not demonstrated stability. SK had a serious fall in net income in periods of crisis. For example, the negative income occurred only in 2009, 2011 and 2014.

Despite the growth of revenue and asset, the index of net cash flow had demonstrated some volatile fluctuations. In 2011 and 2013 there was a cash gap which tells about serious problems in financial planning. Meanwhile, SK continued to grow its capital expenditures (CAPEX) in 2007-2010 which become the reason of cash gap but reducing the value of CAPEX in 2011 and 2012 this problem no more occurred. The situation with dividends paid is interesting. The financial board paid maximum dividends in inner-crisis period of 2010-2012 because financial situation was positive and there is no need to use the undistributed earnings in financial operations but reduces dividends in the periods of crisis when company need additional money to cover financial problems. Finally, the situation with amortization and depreciation remained stable in the whole period because neither financial decisions nor external situations cannot affect the level of amortization.

## 6.2 Regression results

The regression results part includes results of four groups of companies. First group includes the regression of total leverage covering all companies from our list. Also, we divided all companies into two subgroups: first subgroup includes only the companies under governmental rule, i.e. managed by "Samruk Kazyna" while second subgroup contains remaining private companies. Finally, we analyzed separately Kazakhstani companies listed in London Stock Exchange (LSE). Full results of this regression can be found in Table 4. In Table 2 we compare the predicted and detected signs of these four regressions, where Reg 1 means the findings of total leverage of all companies, Reg 2 – regression outcome of governmental companies, Reg 3 – non-governmental companies and finally, Reg 4 – results of companies listed in LSE.

The coefficient of determination for four types of regression explains less than one third of dependency. R-squared for these regressions equals 27.4% for main regression, 70.6% for state companies, 22.6% for non-state companies and 77.1% for companies from LSE.

Table 2: Main, governmental, non-governmental and LSE regressions

| Independent Variable | Predicted Sign | Reg 1 | Reg 2 | Reg 3 | Reg 4 |
|---|---|---|---|---|---|
| Tangibility | - | NS | - | NS | - |
| Profitability | - | - | - | - | NS |
| EBITDA margin | + | + | NS | + | - |
| Asset utilization | - | - | NS | - | - |
| Dividend policy | + | + | + | NS | NS |
| Free cash flow | - | NS | NS | NS | NS |
| Liquidity | - | - | - | - | - |
| Size | - | NS | + | + | + |
| Ownership | - | - | | | |

**Tangibility**

Long-term assets on average consist of 26% of total assets in companies from Kazakhstan. The prevalence of short-term over long-term assets demonstrated that companies can rely on own sources of financing which can lead the decrease the leverage ratio and the correctness of the postulates of pecking order theory. In fact, the tangibility results are negative for three groups of companies, but regression results of main and non-governmental companies are not significant even at 10% significant level. Outcome of governmental companies is significant at 1% level and the value of influence is equal to -0.445 while tangibility of LSE companies is significant at 5% confidence level and is valued at -0.331. We have similar results that Mazur (2007) had found in his work for all types of leverage. The minus signs of regression results confirm our prediction of negative relationship between tangibility and leverage but due to not significance of our results we cannot accept the pecking order theory hypothesis for tangibility here.

**Profitability**

Profitability is negatively correlated with leverage as we expected. Moreover, the profitability influences the leverage ratio at high level of -0.691 while the p-value is equal to 0. The negative sign means that companies prefer to use internal financial resources. The reason of such finding is that most of the firms in Kazakhstan have positive EBITDA value and they can use internal profits to increase the value of their companies. Again, the profitability sign is minus for governmental and non-governmental companies. The change of profitability will decrease the leverage ratio by 0.45 for non-governmental companies and 0.673 for governmental companies these values are significant at 1% level. The higher impact of profitability in state over private owned companies supports our assumption that governmental companies being big mining companies have better EBITDA in compare with private companies mainly working in retail or transportation industries with relatively low depreciation rate. At the same time profitability of LSE companies has positive influence on financial leverage, but this influence is not statistically significant at 10% level. We support the findings of Kaur and Rao (2009) which also demonstrated the negative relationship between profitability and lever-

age while their results are also statistically significant. So, we accept the hypothesis of pecking order theory regarding the influence of profitability for main regression as well as governmental and non-governmental companies, but we reject the hypothesis for LSE companies.

**EBITDA margin**

The relationship of EBITDA margin with financial leverage is positive but small and equals 0.007 for both main leverage and non-governmental companies. For LSE companies the relationship is negative -0.386 which contradicts our hypothesis. All these results are statistically significant at 5% level. We cannot say anything about the relationship between EBITDA margin and leverage of governmental companies due to statistical insignificance of this result. We support the findings of Mazur (2007) regarding positive correlation of EBITDA margin and leverage of main and non-governmental companies. We accept the hypothesis for main leverage and leverage of private companies while reject hypothesis for LSE companies.

**Asset utilization**

The companies in Kazakhstan have demonstrated good value of asset turnover. More than 10% of observations have asset utilization coefficient more than 1. That means that yearly revenue of the company exceeds the total assets which tells about the excellent financial results. Generally, such companies are focused to earn money not from capital allocation but using new technologies or human capital. In our sample companies with asset utilization coefficient more than 1 represent telecommunications or retail sectors. Moreover, asset utilization coefficient more than 0.5 tells that company has positive net earnings which become a source of further financing which will lead the decrease the leverage ratio and the following the pecking order theory. As a result, asset utilization has demonstrated the negative relationship with leverage. Moreover, all these values are statistically significant at 1% level. The total leverage will fall by 18.7% while asset utilization has higher negative influence on state-owned companies leverage and the change is equal to 19%. LSE companies have also big negative relationship between asset utilization and financial leverage and equal to -47.6%. On the other hand, state companies

demonstrated small positive impact which is not significant even at 10% confidence level. These results are identical as Kaur and Rao (2009) have found on the example of Indian companies. We accept the hypotheses of negative relationship between asset utilization and the financial leverage.

**Dividend policy**

We have found that dividends payment ratio is lower for companies under governmental management. This result is interesting because we assumed that such companies will pay higher dividends for the benefit of "Samruk Kazyna" fund but we have found that governmental companies prefer to reinvest their revenues to special projects or to increase the own equity. We got that dividends have positive impact on total leverage and its value is equal to 0.264. At the same time the results for governmental, non-governmental and LSE companies are not significant. Most of the results being statistically insignificant support the findings of Al-Najjar (2011). We accept the hypothesis of positive connection between dividend policy and total leverage ratio but reject the hypothesis for state-owned, private and LSE companies.

**Free cash flow**

We have found that 17% of observations have negative value of FCF. This result is not good in terms of financial management and tells about the impossibility of this portion of companies to use internal resources as a source of financing. The value of influence is negative and equal to -0.073 for governmental firms and higher influence of -0.824 for LSE companies but positive for non-governmental companies 0.13 and a little bit smaller for total leverage or 0.018. From statistical side, FCF has demonstrated insignificant regression results for all other types of companies. Comparable with my findings, Akhtar and Oliver (2009) on the example of Japanese companies have found the unimportance of free cash flow to leverage ratio. We underline the insignificance of the relationship between free cash flow and leverage ratio and reject the hypothesis of negative influence of FCF to leverage ratios.

**Liquidity**

Liquidity coefficient more than 1 tells about the ability of the company to freely pay its short-term obligations by realizing its current assets. The situation when 80% of observations have liquidity coefficient higher than 1 and moreover there are 28 observation which have the coefficient more than 10, demonstrate that such companies could follow the hierarchy in financing. The hypotheses of negative association of liquidity ratio is accepted for total leverage ratio which equals to -0.02, -0.092 for governmental firms, a little bit smaller or -0.021 for non-governmental companies and higher influence of -0.094 for LSE companies. At the same time, these relationships are relatively small. Liquidity ratio is significant for companies from Kazakhstan when the regression demonstrated that p-value lies within 1% confidence interval. Empirical findings of Mazur (2007) support that the increase of liquid assets will lead to the decline of leverage ratio which defines the negative relationship between two variables. These lead that we accept the hypothesis regarding the negative relationship between liquidity ratio for all types of companies.

**Size**

Size is very specific determinant because there is no single way to measure the company as a big, medium or small business. We define the size of the company only by local description as company considering big in Kazakhstan are not big in the US for example. The number of big companies in my sample is less that the number of small companies. Only one third of the total number of companies in my sample can be considered as big while other are medium businesses. We did not include small companies because generally such companies are not presented in stock exchange. Statistically, the impact of size is not significant even at 10% confidence level for main leverage. On the other hand, the impact of size is statistically significant for governmental companies at 1% level being in majority the big businesses. Non-governmental companies in majority being medium-sized companies are also significant at 1% level. But the influence of size is positive and equivalent to 0.014 and 0.019 respectively. Similar small positive relationship was predicted by the Wang, Zheng and Yao (2009) on the example of Chinese companies. Com-

panies listed in LSE are generally big, and regression demonstrates that results are statistically significant at 10% significance level. Having such findings, we reject the hypothesis of pecking order theory regarding the negative influence of size. Size of companies in Kazakhstan have reverse relationship to leverage ratio.

**Ownership**

We have found that government provided financial assistance to some big state-owned monopoly companies during the financial crisis of 2008-2009 and during the fall of oil prices in 2014. This assistance was not considered as a liability and cannot be counted to the increase of leverage ratio. So, the management of these monopolies was not totally relied to external financing and this financial aid from the "Samruk Kazyna" helped some companies to improve their balance sheets. The regression has demonstrated that the influence of state ownership to the leverage ratio is statistically significant at 1% level and equals to -0.078. As we have predicted the influence of state is negative to the level of leverage. We accept our hypothesis of negative impact of state ownership to the leverage ratio.

Overall, we accept the hypotheses for liquidity, profitability, asset utilization and ownership. Also, we accept the hypothesis for tangibility for governmental and LSE companies while rejects for main and non-governmental companies leverage ratio. We accept the hypothesis of positive correlation between EBITDA margin and leverage for main regression and non-governmental companies while reject for LSE companies. Again, we accept the hypothesis of dividend policy determinant for main and governmental companies' regressions. The results of relationship between leverage and FCF are not statistically significant, and we cannot consider this variable in evaluation of debt-to-equity ratio. Finally, we reject the hypothesis for the relationship between size and leverage.

# 7 Discussion

The choice of capital structure is very important in terms of risk and future performance of the firm. In this section we want to describe the financial decisions of

Kazakhstani companies in the period of sample, to analyze the cost of financing and to discuss the importance of the study of capital structure.

Despite we are facing only 10-year period of the survey (2007-2016) we can divide this cycle into several periods in terms of the development of financial markets in Kazakhstan. In the past decade business sector in Kazakhstan faced several shocks which resulted the downturn of activity. Beginning from 2000 the economy in Kazakhstan started restoring from ruins of the 90th. Financial markets and banking system was undeveloped around the turn of the century but this sector skyrocketed in the mid of the first decade of XXI century and reaching its peak in 2007. Non-financial sectors of the economy grew as well by taking huge loans and not considering potential financial risks. As a result, financial crisis of 2008-2009 deprived many companies of their income and big portion of loans became non-refundable. This caused the bankruptcy of many small and medium businesses while big companies from energy sector being quasi-national gained financial help from the government. The policy of frivolous loans were left behind, and companies began to manage their financial risks. For example, starting from 2008 almost all national companies created the department of risk management or hired financial controllers that were obliged to manage the leverage ratio and the structure of liabilities. This step improved the situation with the leverage ratio when in 2009 the average leverage ratio from my sample was 58% while in 2011 this coefficient reduced till 48% and remained constant till the next crisis of 2014-2015 when the ratio of leverage increased till 57% in 2015. In this period companies especially in oil and gas industry challenged serious financial troubles where some companies faced negative net cash flow and need to take external loans to manage financial gaps.

In addition, Kazakhstan's economy being classified as developing and as a result having low credit rating according to world famous credit-rating agencies has no access to cheap loans. Taking loans in Kazakhstan is costly even in the periods of financial stability. According to the National Statistical Agency the cost of average loan to open new business in 2016 varies in the diapason of 15-17%. Moreover,

the base rate of the National bank of Kazakhstan increased in the periods of crisis reaching 11% in 2008 and 2016. It is very clear that doing business is problematic in such conditions. So, the cost and the source of financing becomes extremely important in this circumstance.

Without a doubt, leverage ratio influences many financial indicators and the whole value of the company. Considering the importance of risk management and financial planning, the main findings of pecking order theory become relevant.

# 8 Conclusion

The prime goal of this research was to study the variables that we considered may influence the capital structure decisions. Thus, the fairness of pecking order theory was empirically tested whether it is applicable in companies from Kazakhstan.

We can classify the estimated results into two main groups:

The first group combines the determinants that confirms the principles of the hierarchy in financing:

• The estimation results indicate that profitability, asset utilization, liquidity and ownership are negatively related to leverage. The minus sign of these variables meets the predicted sign and we can say that assumptions of pecking order theory work for these variables;

• Tangibility coefficient follows general hypothesis regarding negative relationship to leverage ratio. But, this coefficient is not statistically significant for both total and non-governmental companies' regressions. But overall, we accept the hypothesis of negative influence of tangibility to leverage;

• Concurrently, dividend policy coefficient is predicted to be positively correlated with leverage. In fact, it is true only for main regression and for governmental companies. We can conclude that dividend policy follows the predictions of pecking order theory;

• EBITDA margin follows the pecking order theory hypothesis for main and non-governmental companies leverage regressions. At the same time, it rejects the

hypothesis for LSE companies.

The second group includes the independent variables that due to statistical insignificance of regression results or such that have the deviations with predicted hypotheses are not associated with the postulates of pecking order theory.

• The regression results have demonstrated that FCF coefficient is totally not significant for all types of financial leverages. This is clear now why many authors did not include this variable for testing the pecking order theory. And only the work of Lopez-Garcia and Sogorb-Mira (2008) consist of this determinant while Akhtar and Oliver (2009) and Mazur (2007) omitted it due to statistical insignificance;

• The results of size coefficient are statistically significant, but it contradicts the hypothetical negative relationship with leverage. We reject the hypothesis of size determinant. After receiving the following results, we can conclude that:

• Actual negative relation between capital structure choice and the profitability demonstrated us that firms tend to not increase their liabilities because this reduces its future profits. Many firms rely on own undistributed earnings to finance company's projects or increase value of the company.

• Direct state control in a big portion of companies have no negative effect in terms of financial management. Despite our assumption about the indifference of the capital structure in such companies, the financial decisions in national companies in Kazakhstan are inclined to minimize financial risks and rely on internal sources. On the other hand, these companies are the drivers in the Kazakhstan's economy and being big monopolies, they demonstrate good financial results.

Theoretical implications in cope with our empirical findings can assist financial managers in applying the capital structure decisions. The reality has demonstrated that some companies are taking serious risks by increasing their liabilities up to 100% while other companies prefer to rely only on own sources. The findings proved the use of diversification in the sources of financing but following the hierarchy in order not to take unnecessary risks. We have found that companies from Kazakhstan on average follow financial leverage rate of 0.5 which allows to

maximize their profits while taking adequate risks.

Finally, after analyzing the received results we can conclude that companies from Kazakhstan partially follow the pecking order theory. Half of our hypotheses was confirmed but on the other side some assumptions had been violated.

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Table 3: Main, government, non-government and LSE regression results

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| VARIABLES | Main | Government | Non-Gov | LSE |
| tangibility | -0.024 | -0.445*** | 0.007 | -0.331*** |
| | (0.037) | (0.048) | (0.046) | (0.096) |
| profitability | -0.691*** | -0.673*** | -0.450** | 0.732 |
| | (0.160) | (0.159) | (0.219) | (0.503) |
| ebitda_margin | 0.007** | -0.006 | 0.007** | -0.386** |
| | (0.003) | (0.056) | (0.003) | (0.184) |
| asset_uti | -0.187*** | 0.023 | -0.190*** | -0.476** |
| | (0.039) | (0.050) | (0.043) | (0.212) |
| dividend | 0.264*** | 0.113** | -105.631 | 23.575 |
| | (0.056) | (0.056) | (74.114) | (22.024) |
| FCF | 0.018 | -0.073 | 0.130 | -0.824 |
| | (0.166) | (0.111) | (0.252) | (0.691) |
| liquidity | -0.020*** | -0.092*** | -0.021*** | -0.094*** |
| | (0.003) | (0.008) | (0.003) | (0.012) |
| size | 0.007 | 0.014*** | 0.019*** | 0.022* |
| | (0.005) | (0.005) | (0.007) | (0.012) |
| ownership | -0.078*** | | | |
| | (0.022) | | | |
| Constant | 0.635*** | 0.792*** | 0.411*** | 1.004*** |
| | (0.092) | (0.074) | (0.126) | (0.181) |
| Observations | 349 | 117 | 232 | 28 |
| R-squared | 0.274 | 0.706 | 0.226 | 0.771 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Summary statistics

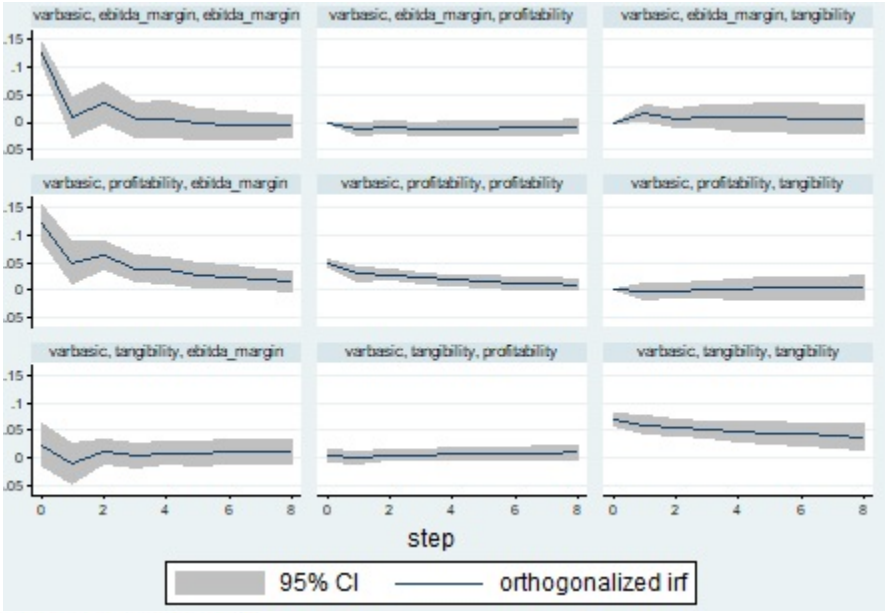
| VARIABLES | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| lev | 349 | 0.509 | 0.226 | 0.098 | 0.99 |
| lev_gov | 117 | 0.484 | 0.207 | 0.098 | 0.99 |
| lev_nongov | 232 | 0.522 | 0.234 | 0.098 | 0.95 |
| lev_lse | 28 | 0.499 | 0.238 | 0.084 | 0.922 |
| | | | | | |
| tangibility | 349 | 0.613 | 0.303 | 0.001 | 2.103 |
| profitability | 349 | 0.052 | 0.081 | -0.171 | 0.5 |
| ebitda_margin | 349 | 0.489 | 2.578 | -1.872 | 19.622 |
| asset_uti | 349 | 0.481 | 0.342 | 0 | 1.524 |
| dividend | 349 | 0.014 | 0.099 | -0.024 | 1.629 |
| FCF | 349 | 0.031 | 0.077 | -0.262 | 0.432 |
| liquidit | 349 | 4.165 | 4.506 | 0.004 | 23.379 |
| size | 349 | 16.276 | 2.39 | 10.079 | 21.104 |

Table 5: Main Financial Information - Samruk Kazyna

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|---|---|---|
| KASE capitalization | 756.9 | 663.9 | 386.5 | 878.7 | 789.0 | 686.7 | 604.9 | 506.1 | 1094.6 | 1240.1 |
| Share of Samruk-Kazyna | 18% | 22% | 43% | 20% | 21% | 26% | 36% | 49% | 31% | 31% |
| Balance Sheet: | | | | | | | | | | |
| Current Assets | 54.6 | 49.9 | 61.5 | 73.7 | 67.2 | 85.7 | 74.3 | 105.5 | 193.1 | 231.5 |
| Long-term Assets | 78.7 | 97.5 | 103.6 | 99.3 | 95.4 | 96.3 | 146.4 | 143.9 | 149.9 | 152.3 |
| Current Liabilities | 62.2 | 59.8 | 65.1 | 74.4 | 69.9 | 72.3 | 115.8 | 107.4 | 194.6 | 205.8 |
| Long-term Liabilities | 30.3 | 40.4 | 47.4 | 53.6 | 43.3 | 55.7 | 50.6 | 73.1 | 74.8 | 75.2 |
| Equity | 41 | 47.3 | 52.5 | 44.9 | 49.3 | 53.8 | 54.3 | 69.2 | 73.6 | 102.7 |
| Total Balance | 133.4 | 147.5 | 165.1 | 172.9 | 162.5 | 181.9 | 220.7 | 249.5 | 343.1 | 383.8 |
| Income Statement: | | | | | | | | | | |
| Revenue | 16.4 | 26.1 | 22.5 | 26.7 | 32.4 | 38.8 | 34.4 | 41.4 | 46.1 | 51.9 |
| EBITDA | 2.8 | 2.5 | -6.4 | -0.4 | -2.2 | 2.3 | 4.7 | 1.3 | 5.8 | 6.2 |
| Net Income | 2.3 | 2.2 | -6.2 | 0.07 | -2.1 | 4.2 | 4.8 | -2.3 | 2.9 | 4.7 |
| Cash-Flow Statement: | | | | | | | | | | |
| Capital Expenditures | 1.3 | 2.7 | 4.0 | 3.2 | 2.5 | 2.9 | 4.2 | 5.4 | 5.3 | 6.1 |
| Dividends Paid | 0.2 | 0.5 | 0.4 | 1.3 | 1.4 | 0.9 | 0.6 | 0.5 | 0.8 | 1.4 |
| Depreciation | 0.5 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 | 0.8 | 0.9 | 0.7 | 0.8 |
| Net CF | 11.8 | 0.7 | 11.2 | 6.1 | -13.7 | 10.2 | -6.8 | 5.7 | 12.9 | 12.4 |

## Appendix 4

The results of lag-order selection statistics for series of vector autoregressions




Selection-order criteria
Sample: 7 - 0147, but with gaps Number of obs = 57

| lag | LL | LR | df | p | FPE | AIC | HQIC | SBIC |
|---|---|---|---|---|---|---|---|---|
| 0 | 54.7581 | | | | 2.7e-11 | -1.64063 | -1.5292 | -1.35389 |
| 1 | 528.148 | 946.78 | 64 | 0.000 | 1.6e-17 | -16.0052 | -15.0022 | -13.4245* |
| 2 | 599.77 | 143.25 | 64 | 0.000 | 1.4e-17 | -16.2726 | -14.3782 | -11.398 |
| 3 | 691.194 | 182.85 | 64 | 0.000 | 7.5e-18 | -17.2349 | -14.4489 | -10.0663 |
| 4 | 841.662 | 300.94* | 64 | 0.000 | 8.1e-19* | -20.2688* | -16.5914* | -10.8063 |

Endogenous: tangibility profitability ebitda_margin asset_uti dividend FCF liquidity size
Exogenous: _cons